

USER'S MANUAL

HAKI® Ram



Important information

HAKI's product liability and erection instructions apply only to scaffolds that are entirely composed of components that have been made and supplied by HAKI.

HAKI's type examination certificate applies only to scaffolds whose materials, dimensions and design accord with those specified in the documentation upon which this certificate is based.

HAKI's scaffold systems must not be erected using components of makes other than HAKI or be connected to scaffolds of makes other than HAKI. In such cases, a special study of load-bearing capacity must be carried out. However, HAKI has no objection to the customary addition of scaffold tubes and approved couplers to the scaffold.
















Adding components from different suppliers may invalidate the insurance cover.

For scaffold structures that are not covered by these erection instructions, please contact HAKI's technical department.

HAKI reserves the right to make technical modifications on a continual basis.

HAKI colour code

Horizontals and diagonals are marked with their nominal sizes (bay sizes) and a colour code. The marking is a useful means of identification when erecting and handling the scaffold material.

564 	1050 	1964 	3050 
700 	1250 	2050 	3650 
770 	1550 	2500 	4050 
1010 	1655 	2550 	

Forces and dimensions

1000 N = 1 kN ~ 100 kg

10 N ~ 1 kg

All measurements in mm

HAKI user's manual

Universal, Light, Continental, Ram, Stair Tower, Block Bracket and Weather protection.

The latest versions of HAKI user's manuals can be downloaded from our website, www.HAKI.se.

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HAKI Ram

Following examination by the SP Technical Research Institute of Sweden, the scaffolding has been issued with a Type Examination Certificate in accordance with the requirements of Ordinance AFS 1990:12 of the Swedish Work Environment Authority Code of Statutes and SS-EN 12810 and 12811 – Certificate No. 14 55 04 (hot-dip galvanized) and 14 55 08 (aluminium) – for load class 4 (3.0 kN/m²) and load class 3 (2.0 kN/m²) respectively.

The calculations were carried out using method 1172 of the SP Technical Research Institute of Sweden.

General data

The HAKI Ram scaffolding system consists of vertical frames, decking units and guardrail frames.

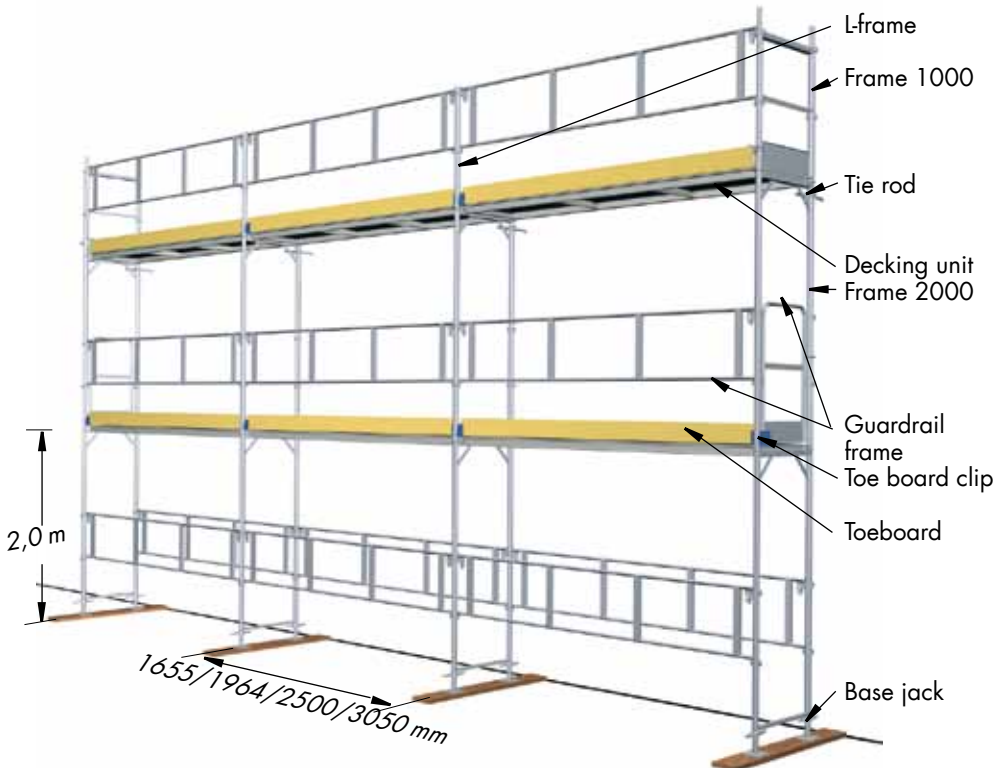
The scaffolding is erected with bay widths of 700 mm and bay lengths of 1655, 1964, 2500 or 3050 mm and with 2000 mm between lifts.






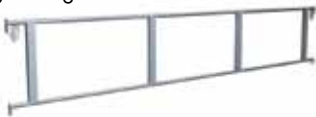
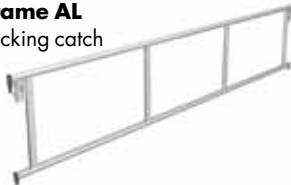
Using brackets, the width of the work platforms can be increased by 310 mm or 620 mm. Manufactured in hot-dip galvanized steel and aluminium.





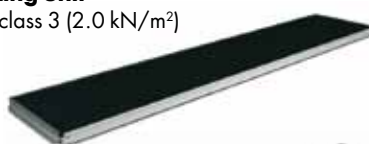
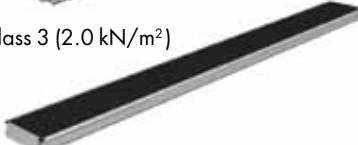
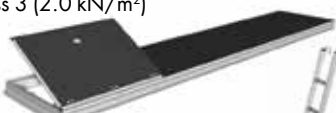

Marking








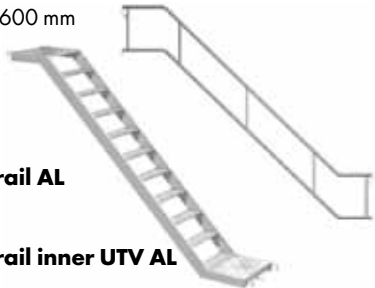
All components with the exception of locking pins etc. come permanently marked with the HAKI logo and the last two figures of the year of manufacture (☐S11).

All loadbearing components are marked for full traceability. For further information, please refer to the HAKI Safety Guide.









Name		Code	Item No.	Weight
Base jack Adjustable BS = 55-570 mm BSL = 40-650 mm		BS	2071000	5.0
		BSL	2073003	9.2
Frame		RA 500	8731053	7.0
		RA 800	8731084	10.0
		RA 1000	8731104	12.4
		RA 2000	8731204	17.1
Frame With toeboard		RAF 1000	8731105	14.5
Frame AL		RA 500 AL	4731053	7.0
		RA 800 AL	4731083	10.0
		RA 1000 AL	4731103	12.4
		RA 2000 AL	4731203	17.1
L-frame		RAL 1000	8734100	6.1
Guardrail frame With spring locking catch		SKRD 1655	7052161	7.8
		SKRD 1964	7052191	8.5
		SKRD 2500	7052246	9.6
		SKRD 3050	7052301	11.4
Guardrail frame AL With spring locking catch		SKRD 1655 AL	4052161	5.9
		SKRD 1964 AL	4052191	6.6
		SKRD 2500 AL	4052246	7.8
		SKRD 3050 AL	4052301	8.9

Name		Code	Item No.	Weight
Guardrail frame SKRDF With toeboard		SKRDF 700	8753000	7.5
Guardrail frame SKRA		SKRA 500-700	8751075	4.4
Bracket Jaw width 22 mm		SK 300 SK 700 SK 800	8775030 8775070 8775080	3.9 7.9 9.1
Bracket AL Bracket SK 700 with spigot Bracket SK 650 without spigot Jaw width 22 mm		SK 700 AL SK 650 AL	4211072 4211073	3.5 3.0
Decking unit Load class 3 (2.0 kN/m ²)		B=620 mm PL 1655x620 AL PL 1964x620 AL PL 2500x620 AL PL 3050x620 AL	4081160 4081190 4081250 4081300	11.7 14.0 18.3 22.5
Load class 3 (2.0 kN/m ²)		B=310 mm PL 1655x310 AL PL 1964x310 AL PL 2500x310 AL PL 3050x310 AL	4082160 4082190 4082245 4082300	8.4 9.5 12.3 14.7
Decking unit hatch Load class 3 (2.0 kN/m ²)		B=620 mm PLLU 1964x620 AL PLLU 2500x620 AL PLLU 3050x620 AL	4081191 4081245 4081302	14.5 19.5 23.5
Ladder ST For decking unit with hatch		ST 2100 AL	2091210	3.4

Name	Code	Item No.	Weight
Toeboard Wood, yellow glazing paint Any logo can be applied 	FL 3000x150x32	2025300	5.8
Toeboard clip Plastic 	LFP 150x32	2131001	0.2
	LF 70	7161006	1.0
Tie rod Rod diameter Ø12 mm Permissible load 2.5 kN 	SVF 600	7072060	0.6
	SVF 800	7072080	0.8
Tie rod clamp Permissible load 2.5 kN 	BVF	7071000	0.6
Tie rod tube Rod diameter Ø48 mm Permissible load 2.5 kN 	SVF 450x48	8832045	1.9
	SVF 900x48	8832090	3.3
	SVF 1200x48	8832120	4.4
Right angle coupler Jaw width 22 	KF 48x48 22 mm	2041012	1.0
Wall tie With flexible plate Two Ø22 holes in the plate 	VST 1000	7111100	5.3
	VST 2000	7111200	9.1
	VST 3000	7111300	13.7
	VST 4000	7111400	16.7
	VST 5000	7111500	21.9
	VST 6000	7111600	24.5
Stair UTV AL With platform and locking catch LxH 3050x2000 mm Width 600 mm 	UTV 1000 AL	4102100	12.1
	UTV 2500x2000 AL	4102247	22.9
	UTV 3050x2000 AL	4102302	29.2
Handrail AL	HL 2500x2000 AL	4058245	9.2
	HL 3050x2000 AL	4058300	10.3
Handrail inner UTV AL	HLI UTV AL	7058253	11.3

Name	Code	Item No.	Weight
Stair UTV With platform and locking catch at the top LxH 3050x2000 mm Width 600 mm	UTV 3050x2000	2092200	39.7
Handrail	HL 2500x2000	2161300	19.3
Handrail inner UTV	HLI	7058254	12.1
Bracket handrail post For stair UTV steel 2092200	FF-UTV	8752001	2.5
Handrail post As guardrail post	LSS 1000	7015102	4.2
Landing link panel UTV AL/Frame For covering the hole between platform and frame Only for UTV UTV 3050x2000 AL		7211044	3.6
Safety gate with net SGF Continuously adjustable in height Jaw width 22 mm	SGF 1655 SGF 1964 SGF 2500 SGF 3050	7055161 7055191 7055250 7055300	17.0 19.4 23.2 26.8
Transom ground level	ULB 700	8743700	2.4
Platform locking	LSB 0.7 LSB 700	8744700 8744701	2.3 2.3
Transom intermediate level Jaw width 22 mm	TP 700	8743701	3.7

Name	Code	Item No.	Weight
Adapter guardrail For guardrail for corner applications etc. Jaw width 22 mm 		8792000	0.6
Locking device guardrail For guardrail, tube diameter 38 mm Jaw width 22 mm 		8833000	0.8
Locking hook For locking standard joint in connection with tensile load, e.g. when lifting or when scaffolding is used for temporary roof Not for suspended scaffolding 	LK 10x48	8793000	0.1
Pavement frame With two fixed and two adjustable spigots Bay width 1420 mm 	1420	8732201	38.9
Lattice beam 450 AL 	FB 4100 AL FB 6100 AL FB 8100 AL	4032410 4032610 4032810	16.7 24.3 32.2
Ramainer For twenty vertical frames The frames are lashed to the ramainer with strapping 		8871000	28.9

For other accessories, see HAKI Component List.

Before erecting the scaffold, check and flatten out the ground. The support surface must not be subject to uneven settlement. Its bearing capacity may be improved with the help of mud sills.



1.

1. Set out the material for the bottom of the scaffold along the facade.

Place the base jacks about 200 mm out from the facade and at the bay lengths that are to be used.

If inside brackets are to be used, increase the distance to the façade by the length of the bracket.

The greatest permissible distance between the facade and work platform without an internal guardrail is 300 mm.

Always start erection at the point that is situated highest.

When erecting, always check carefully that the material is not damaged. Damaged material must not be used. For more information on damaged material and renovation, please refer to the HAKI Safety Guide.



2.

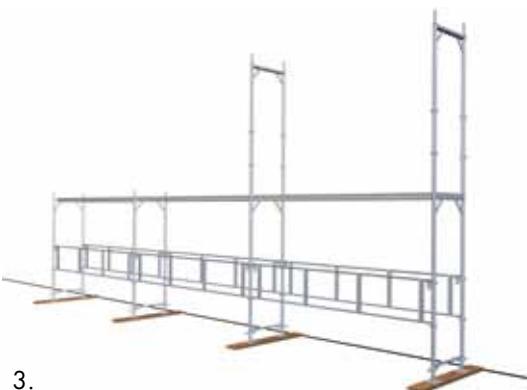
2. Erect the first two frames on the base jacks and hook both the internal and external guardrail frames into the pockets on the frames.

Lock the guardrail frames in place.

Continue erecting the bottom of the scaffold using base jacks, frames and guardrail frames bay by bay.

Check the levels step by step in both the transverse and longitudinal directions using a spirit level and adjust using the base jacks.

If required, the first lift can be provided with decking mounted on ULB 700 transoms ground level.

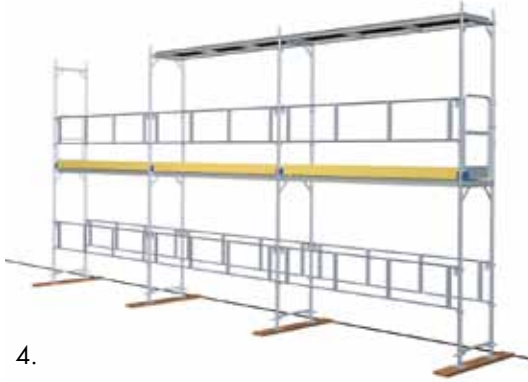


3.

3. Fit decking for the second lift.

Make sure that the decking hooks in the grooves of the frames.

Lock the decking in place with the frames of the second lift.



4.

4. Fit the guardrail frames and end guardrails for the second lift.

Fit the toeboards with the aid of the toeboard clips.

Fit decking for the third lift.

5. Anchor the scaffolding using tie rods and clamps.

Check that the fixings in the facade can carry the forces involved.

Continue erecting the subsequent lifts as described above.

Use approved lifting aids for transport of the material.



5.

On the uppermost lift, RA 1000 frames with toeboards are fitted at the ends of the scaffolding. Next to these, toeboards are locked using LF 70 toeboard clips.

RA 1000 frames can also be used at the ends of the scaffolding. Toeboards must then be added.

RAL 1000 L-frames are otherwise fitted.

Alternatively, RA 2000 frames can be used for the entire top lift.

Dismantling is carried out in reverse order.

Scaffolding components must not be thrown down from the scaffolding.

You should not use tools such as steel hammers when dismantling owing to the risk of local buckling. (The risk is greater for aluminium). For assessment and renovation of damaged material, please refer to the HAKI Safety Guide.



6.

Internal ladders

6. Decking with a hatch must be used instead of ordinary decking in bays where ladders are sited.

The decking with a hatch must be installed so that the ladders are positioned at opposite ends of the bays on each subsequent lift and the ladders must be securely hooked onto the deck above.



7.

External stairway

7. The UTV stairway is fitted in an external bay of length 3050 mm using extra frames. The external bay should be erected parallel with the rest of the scaffolding.

Lay out two base jacks. Erect one frame on each and connect these frames to the frames of the main scaffold using two KV 48x48 swivel couplers for each frame, one at the top and one at the bottom.



8.

8. Hook on a UTV stairway and lock using a new frame. Connect this frame to the frame of the main scaffold using two KV 48x48 swivel couplers.

Fit the handrail at a height of 1.0 m and provide the top end with an SKRDF 700 guardrail frame.

Erect the next lift using a stairway, frames, handrail and guardrail frames.

The gap between the scaffold and the stairway is covered using a landing link panel for UTV.

If required, an inner handrail is fitted on the inside of the flight of stairs.

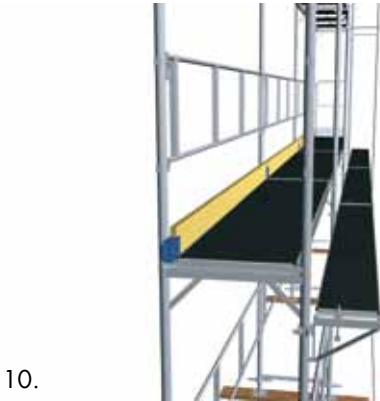


9.

9. Continue erection up to the desired height.

At the top level, an RAF 1000 frame is fitted and a handrail post holder is fitted on the inside of the stairway. An LSS 1000 handrail post is fitted into the holder so that an SKRD 2500 guardrail frame can be fitted between the post and L-frame.

The guardrail frame provides fall protection at the top level of the scaffold. At other levels, the next stairway provides sufficient protection.



Brackets

Brackets can be fitted at various heights using the coupler.

Fit the decking units. Make sure that the decking units are hooked into the grooves of the brackets and lock the decking units successively using the T-lock device.

Frames with brackets must be anchored both at the top and at the bottom.

10. SK 300 internal brackets

These are fitted in combination with 310 mm decking. The ends of the bracket platforms should be bounded by scaffold tubes.



11. SK 700 internal brackets

Where required, provide the decking on brackets with end guardrails with the aid of L-frames. Lock the L-frames using locking pins and locking hooks.

12. SK 700 external brackets

Brackets and decking should be fitted as described above, but without using the T-lock device.

Erect L-frames and lock them using locking pins and locking hooks.

Erect guardrail frames, end guardrails and toeboards.

If the decking on brackets is on the top lift, the decking on the main scaffold should be secured using LSB 700 platform locking units.

The scaffold should be anchored to the wall at the level of the bracket decking.



Cantilevered scaffold

SK 800 brackets are used as the basis for cantilevered scaffolding starting at any level.



13.



14.

13. SK 800 external brackets

A maximum of three frames or scaffolding of 6.0 m in height can be erected on reinforced SK 800 brackets. The cantilevered scaffolding and the platform below the cantilever must be anchored at each lift level.

14. On a cantilevered scaffold, the SK 800 brackets must be reinforced using bracing of SR 48 scaffold tubes and KV 48x48 swivel couplers, fitted to or immediately above the frame below, as close as possible to the standard joints.



15.

Safety gate with net

15. Safety gates with nets are fitted in the same way as guardrail frames.

Their design eliminates the need for toeboards on this lift.

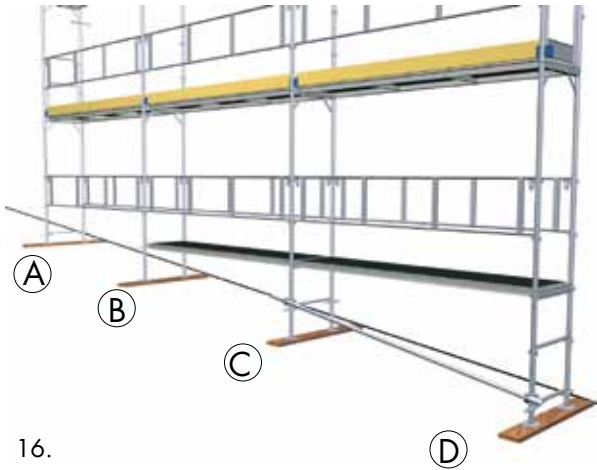
The safety gates with nets are used as personal fall protection and to prevent objects falling, e.g. in connection with roof work on the top lift.

Large differences in the ground level

16. Where there are large differences in the level of the ground, compensate for these by using RA 500 or RA 1000 frames and ULB 700 ground level transoms.

- (A) RA 2000 frame erected on base jacks in the usual way.
- (B) Base transom fitted to base jacks as support for decking.
- (C) RA 500 frame erected on base jacks in the usual way.
- (D) RA 1000 frame erected on base jacks in the usual way.

If guardrail frames cannot be erected between the base frames, i.e. between C and D, SR 48 scaffold tubes are fitted between the outer standards using swivel couplers.



16.

Pavement frames

17. Pavement frames are erected on base jacks. Guardrail frames are hooked into the pockets of the pavement frames both on the inside and outside of the scaffolding.

In scaffolding with pavement frames, the lowest wall tie must be fitted to the first frame of the main scaffolding at a height not exceeding 4.6 m above the ground.

The pavement frames have 2 fixed and 2 adjustable spigots, which allow some flexibility when erecting the frames above.



17.

Bracing and tying-in

Each lift must be equipped with guardrail frames on the outside of the scaffolding 1.0 m above the lift level and with decking.

The lower frames must all be fitted with guardrail frames both internally and externally. Guardrail frames must always be fitted at the lowest possible level.

Each inside frame standard must be tied to the facade or equivalent at every 4th metre in height adjacent to the corner of the frame.

The lowest tie must be fitted no more than 4.6 m above ground level.

There must be ties that can carry horizontal forces on at least every 5th pair of frame standards along the scaffold and at every level of ties.

In addition, we recommend that the scaffold always be anchored as high up as possible.

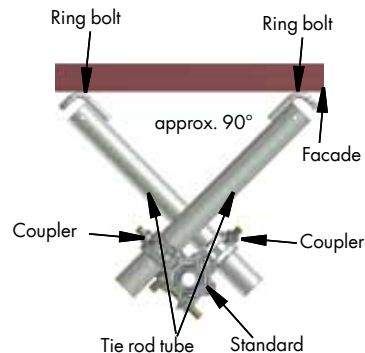
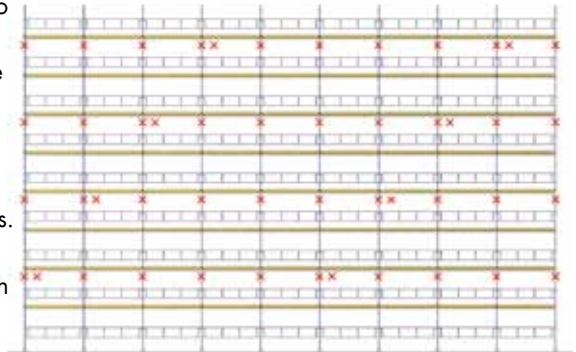
Frames with brackets must be anchored at the top and at the bottom.

Cantilevered scaffolding and the lift below the cantilevered scaffolding must be anchored at every lift level.

Frames with lattice beams must be anchored at the fixing points of the beams.

Ties that can withstand horizontal forces should be specified for a load of 3.2 kN (3.4 kN) parallel with the façade and 5.2 kN (5.2 kN) perpendicular to the façade. Other ties should be dimensioned for a load of 2.5 kN (3.2 kN) perpendicular to the façade. The values in parentheses refer to HAKI Ram in aluminium.

Where a scaffold is covered in sheeting, the number of ties must be increased to take account of wind load. Separate calculations are therefore required.



Guardrails

Decked lifts must be provided with guardrail frames and toeboards if the fall height is 2.0 m or more.

Double handrails must be fitted to access stairways.

Permissible construction heights

The tables are valid for HAKI Ram scaffolding with bay widths 700 mm, bay lengths 3050 mm, lift heights 2.0 m, vertical distances between ties of 4.0 m, and erected using HAKI Ram decking units.

The permissible load on a standard is 14.5 kN (8.6 kN for external and 6.7 kN for internal standard). The support surface must be capable of withstanding a design load per standard of 29.3 kN (15.4 kN). The values in parentheses refer to HAKI Ram aluminium.

Work must only be carried out on one level at a time.

Brackets can be fitted to the five highest lifts of the finished scaffolding.

Other bay lengths and load classes will have an effect on the permissible construction height. Please contact HAKI's technical department in these cases.

Permissible construction heights for HAKI Ram Steel

Construction	Load class / Permissible load [kN/m ²]		
	1 0.75	2 1.5	3 2.0
without brackets	64.6	58.6	54.6
with SK 300 brackets, 5 lifts, internal	64.6	58.6	54.6
with SK 700 brackets, 5 lifts, internal	54.6	42.6	36.6
with SK 700 brackets, external	38.6	32.6	30.6
cantilevered scaffolding SK 800*	44.6	38.6	34.6

* For cantilevered scaffolding, a maximum of three frames (6 m height) can be erected on SK 800 brackets reinforced with scaffold tubes fitted to or just above the frames immediately below.

Permissible construction heights for HAKI Ram Aluminium

Construction	Load class / Permissible load [kN/m ²]		
	1 0.75	2 1.5	3 2.0
without brackets	34.6	28.6	24.6
with SK 300 brackets, 1 lift, internal	34.6	10.6	-
with SK 300 brackets, 5 lifts, internal	26.6	-	-

Permissible loads on platforms

Platform	Width [mm]	Length [mm]	Load class	Permissible load [kN/m ²]
Main scaffolding decking	620	1655-3050	3	2.0
Bracket decking	310	1655-3050	3	2.0

Access ways

Access is usually provided by means of HAKI UTV stairways that are fitted to the outside of the scaffold using extra frames (see erection 7 – 9).

Steel scaffolds having UTV stairways fitted externally may be built to a height of 37.5 m.

Alternatively, the HAKI Stair Tower may be used. See User's Manual HAKI Stair Tower.

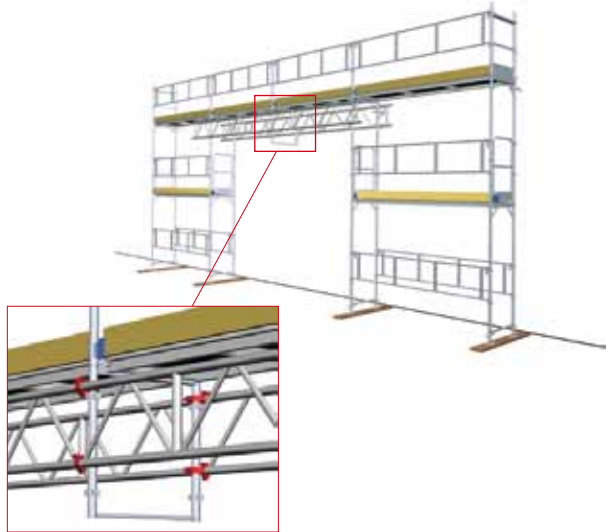
Lattice beams

Aluminium lattice beams


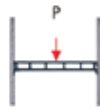
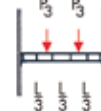
Aluminium lattice beams are fitted in pairs on the inside and outside of the scaffold. Both the top and bottom tubes must be fixed to the frames using KV 48x48 right angle couplers. The height of the beams is adjusted so that the decking will be horizontal.

Frames with lattice beams must be anchored at the fixing points of the beams.

The lattice beams are braced against lateral movement by the fitting of RA 800 units at a maximum of every third metre as a basis for further scaffolding.



Permitted loads on lattice beams when erected as described above.

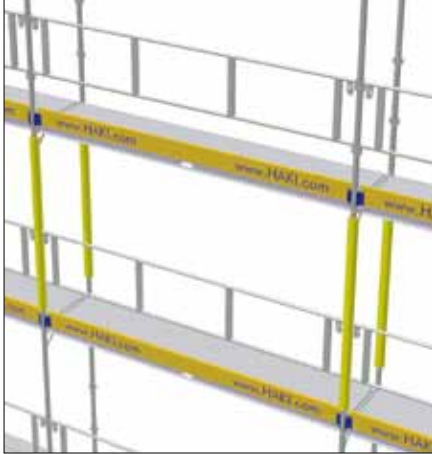
				
Lattice beam	Permissible load q [kN/m]	Uniformly distributed load Q [kN]	Centre point load P [kN]	Point loads $P3$ [kN]
Aluminium				
FB 4100 AL	4.9	19.4	7.5	7.5
FB 6100 AL	3.0	18.3	7.5	6.9
FB 8100 AL	1.7	13.7	6.9	5.1

Attachment points for personal fall protection equipment

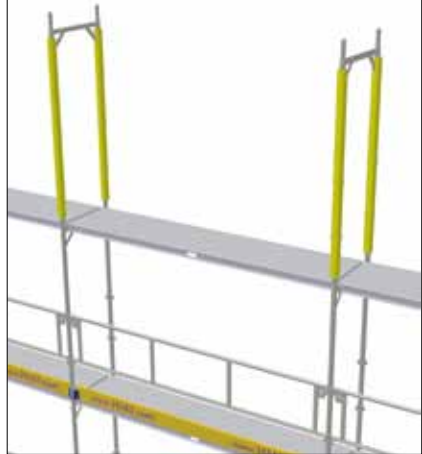
Permissible points of attachment for personal fall protection equipment are as described below.

PLEASE NOTE: Recommendations for points of attachment apply provided that the component in question is otherwise without load and that only one person is attached to the same component at any one time.

Components that have been subjected to damage from fall protection equipment must be scrapped and replaced by new material.



Around a standard in a frame between two lifts.



On the highest lift, around a standard in a frame that has been erected and locked using locking hooks.



PLEASE NOTE! The frame must be locked using locking hooks both internally and externally.

No other points of attachment can be recommended. Fall protection equipment **MUST NOT** be attached to guardrails, brackets and cantilevers, i.e. beams fixed at only one end.

Fall protection equipment **MUST NOT** be attached to components that have not been locked into place.

PLEASE NOTE: Use only approved safety equipment.



CERTIFIKAT

TYPKONTROLLINTYG

Nr 14 55 04

Ramställning

Innehavare/Tillverkare/Leverantör

HAKI AB, 280 63 Sibbhult

Produktnamn

HAKI Ramställning

Produktbeskrivning

Enligt bilaga till detta certifikat. Teknisk dokumentation enligt underlag till SP nr P703771

Kravspecifikation

Arbetskyddsstyrelsens författningssamling AFS 1990:12 Ställningar, 6 § (SPs certifieringsregler SPCR 064) och SS-EN 12810-1

Tillåten belastning

Lastklass 3 (2,0 kN/m²) med förutsättningar enligt produktbeskrivningen

Märkning

Samtliga komponenter exkl. lås, sprintar etc. skall vara försedda med varaktig märkning med HAKIs logotyp och tillverkningsår (2 siffror). Produkterna får också förses med märkning enligt nedan.

Giltighetstid

Typkontrollintyget gäller längst till och med 20 december 2017

Övrigt

Detta typkontrollintyg ersätter intyg med samma nummer daterat 9 mars 1999 och utfärdades ursprungligen 30 december 1997

Borås den 20 december 2007

**SP Sveriges Tekniska Forskningsinstitut
Certifiering**


Lennart Månsson
Chef certifiering


Gunnar Söderlind
Certifieringsingenjör

Typkontrollintyg utfärdat av ackrediterat certifieringsorgan

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Box 857
501 15 Borås

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010-516 50 00
033-13 55 02

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Akrediterade certifieringsorgan utses av SWEDAC (Styrelsen för ackreditering och teknisk kontroll), enligt lag.
Detta typkontrollintyg får endast återges i sin helhet, om inte SP i förväg skriftligen godkänt annat



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Notes

Notes

SAFETY CHECKLIST

1. Supporting surface checked with regard to load-bearing capacity
2. Distance to wall or similar as short as possible
3. Scaffold aligned correctly horizontally and vertically
4. Components correctly fitted and locked
5. Bracing correctly fitted
6. Anchoring with right number and placing of ties
7. Decking correctly fitted
8. Guardrail with toeboard if drop is two metres or more
9. Suitable means of access to scaffold
10. Scaffold erected for correct class of load

